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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/758,205	01/16/2004	Hideki Higashitani	2004-0067	4879

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EXAMINER	
LAM, CATHY FONG FONG	
ART UNIT	**PAPER NUMBER**
1775	

DATE MAILED: 10/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/758,205	HIGASHITANI, HIDEKI	
	Examiner	Art Unit	
	Cathy Lam	1775	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5 and 10-14* is/are rejected.

7)☒ Claim(s) *6-9* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 January 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. 10-420,876.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *1-16,2-23,6-8,7-12*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-2, 10 and 13 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Andou et al (US 6197407).

Andou teaches a circuit board comprised of an electrical insulating substrate, an adhesive and a wiring transfer layer (Fig. 1(f)).

Adhesive layers (101) are formed over the electrical insulating substrate (102). The adhesive layers are semi-cured thermosetting resin (col 3 L 24-27 & L 34-35). Through holes are formed in the electrical insulating substrate, and conductive paste is filled into the through holes (col 3 L 3-6).

A wiring transfer layer comprised of a supporting base (106) and wiring layers (107) are superposed onto both surfaces of the electrically insulating substrate and over the filled through holes (col 9 L 66-col 10 L 5).

Since the adhesive layers on the insulating substrate are uncured layers, when the wiring transfer layers bring into contact with the adhesive layers, the adhesive layers would conform to any surface roughness (or condition) of the wiring transfer layer. The examiner takes the position that the adhesive layers (101) are part of the electrical insulating substrate (102).

Andou also teaches a multilayer circuit board by stacking a plurality of single circuit board (col 15 L 9-34 & Figs. 4(a) –(e)).

3. Claims 1-2 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Chen et al (US 6346335).

Chen discloses a composite material comprised of a support layer (12), a copper foil (14) and a bond strength enhancing agent (20).

The copper foil (14) is releasably formed onto the support layer (12) and the bonding strength enhancing agent (20) is formed onto the surface of the copper foil that faces away from the support layer (Fig. 1). The bond strength enhancing agent (20) are copper dendrites (col 4 L 49-53).

The composite is bonded to a dielectric substrate (22) which may be a rigid or a flexible layer. An adhesive may be used for bonding between a rigid dielectric substrate and the composite. For a flexible board, the dielectric substrate is an uncured liquid or gel polymer cast onto the composite foil (col 5 L 1-20).

The examiner takes the position that the dielectric substrate has a surface that conforms to the surface of the copper foil (14), or the dielectric surface is complementary to the copper foil surface.

4. Claims 1-2 and 10-14 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Hayashi (US 6359235).

Hayashi discloses a multilayer wiring board having an electronic device (or a component) embedded.

The multilayer wiring board is comprised of a plurality of single wiring boards. The single wiring board is comprised of a semi-cured insulation sheet (1) and a wiring transfer film (5). A wiring pattern (4) is formed onto the wiring transfer film (5). The insulating sheet (1) has through holes (2) formed in the thickness direction and conductive paste (3) is filled into the through holes (2). The wiring transfer film (5) is brought into contact with the insulating sheet (1) and the wiring pattern is bonded to the surface of the insulating sheet (1) and in electrical contact with the conductive paste (3) (col 5 L 35-38 & L 57-58), Figs. 1A-1E).

The examiner takes the position that the insulating sheet conforms the shape of the wiring pattern of the transfer film, in other words the uncured insulating sheet is complementary to the surface of the wiring transfer film.

A semiconductor device (or a component) is embedded within the multilayer wiring board (Figs. 6A-6E & col 9 L 28-35).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-5 and 10-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Andou et al (US 6197407) or Chen et al (US 6346335) or Hayashi (US 6359235) in view of Chen (US 5250363).

Andou, Chen '335, and Hayashi teach a printed wiring board comprised of a wiring transfer sheet and an insulating substrate. The wiring transfer sheet has a wiring pattern formed on its surface that bring into contact with a semi-cured surface of the insulating substrate.

The examiner takes the position that the insulating substrate has the surface complementary to the surface of the wiring transfer sheet.

The prior art however do not teach the surface of the insulating substrate has a plurality of convexities nor the surface of the transfer sheet has a plurality of concavities.

Chen '363 teaches a printed circuit board comprised of a conductive foil and a dielectric substrate. The conductive foil has a roughened surface that would be bonded to the dielectric substrate (32) (col 1 L 51-53).

In view of the Figures, the dielectric substrate (32) has its bonding surface conforms to the surface roughness of the conductive foil (12) (Fig. 3). The examiner takes the position that the dielectric substrate has a plurality of convexities and the conductive foil has a plurality of concavities on its bonding surface.

In view of the prior art teaching, one skill in the art would fabricate a PWB having roughened surfaces on the conductive foil and on the dielectric substrate surface because it improves the bonding reliability.

Regarding to the dielectric substrate has convexities occupy 50-98% of the exposed area. The examiner takes the position that convexities and concavities can easily be made by pressing a layer with surface concavities and convexities, respectively, to reach the desired volume %

Allowable Subject Matter

7. Claims 6-9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cathy Lam whose telephone number is (571) 272-1538. The examiner can normally be reached on 9am-6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Jones can be reached on (571) 272-1535. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Cathy Lam
Primary Examiner
Art Unit 1775

cfl
September 26, 2005